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USATECOM Project No. 1-6-4030-12
Report No. DPS-2309



FINAL REPORT ON
PRODUCT IMPROVEMENT TEST
OF
TRUCK, UTILITY, 1/4-TON, 4X4, M151, MODIFIED
WITH SOLID REAR AXLE
BY
C. M. BRYZEK, JR.
MARCH 1967

ABERDEEN PROVING GROUND
ABERDEEN PROVING GROUND, MARYLAND

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RDT&E PROJECT NO. NOT AVAILABLE

USATECOM PROJECT NO. 1-6-4030-12

PRODUCT IMPROVEMENT TEST OF
TRUCK, UTILITY, 1/4-TON, 4X4, M151, MODIFIED
WITH SOLID REAR AXLE

FINAL REPORT

BY

C. M. BRYZEK, JR.

MARCH 1967

ABERDEEN PROVING GROUND
ABERDEEN PROVING GROUND, MARYLAND
21005

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ABSTRACT

A product improvement test was conducted on a truck, utility, 1/4-ton, 4x4, M151, modified with solid rear axle, at Aberdeen Proving Ground (APG) from 12 April to 30 December 1966. The purpose of this test was to determine the engineering performance and durability characteristics of the vehicle. The vehicle was subjected to limited engineering performance tests and a 20,000-mile durability test. It was concluded that the M151 modified with solid rear axle was unsatisfactory due to lack of durability of a majority of the modified components.

FOREWORD

Development and Proof Services was responsible for conducting the test and preparing the test report.



18001-1923-AMC-66-/82: Frontispiece.

ABERDEEN PROVING GROUND
ABERDEEN PROVING GROUND, MARYLAND 21005

USATECOM PROJECT NO. 1-6-4030-12

FINAL REPORT ON PRODUCT IMPROVEMENT TEST OF
TRUCK, UTILITY, 1/4-TON, 4X4, M151,
MODIFIED WITH SOLID REAR AXLE

12 APRIL THROUGH 30 DECEMBER 1966

SECTION 1. INTRODUCTION

1.1 BACKGROUND

Production of the truck, utility, 1/4-ton, 4x4, M151, began in 1960. Since introduction of the vehicle, several accidents have occurred involving turnover of the vehicle and fatalities.

In an effort to reduce the accident rate, an M151 was modified to incorporate a solid rear axle and thus provide better handling characteristics by eliminating oversteer tendencies. This modification would also result in a reduced cost.

One modified M151 was sent to Aberdeen Proving Ground, Maryland to undergo engineering performance and endurance tests.

1.2 DESCRIPTION OF MATERIEL

The test vehicle was a standard truck, utility, 1/4-ton, 4x4, M151, modified in the following areas:

- a. Body - Frame. The unitized body - frame structure was modified in the area behind the driver's and assistant driver's seats. The outer frame rails were increased in strength and simplified in construction. The rear suspension leaf-spring attaching brackets were incorporated into the unitized structure by welding them to the redesigned outer rails. The rear cross member of the frame was redesigned and relocated to provide clearance for the new rear axle assembly and attachment of the rear shock absorbers.

- b. Rear Axle. The rear differential carrier and independent wheel drive shafts were replaced by a solid axle assembly (ref Figure 1.2-1).

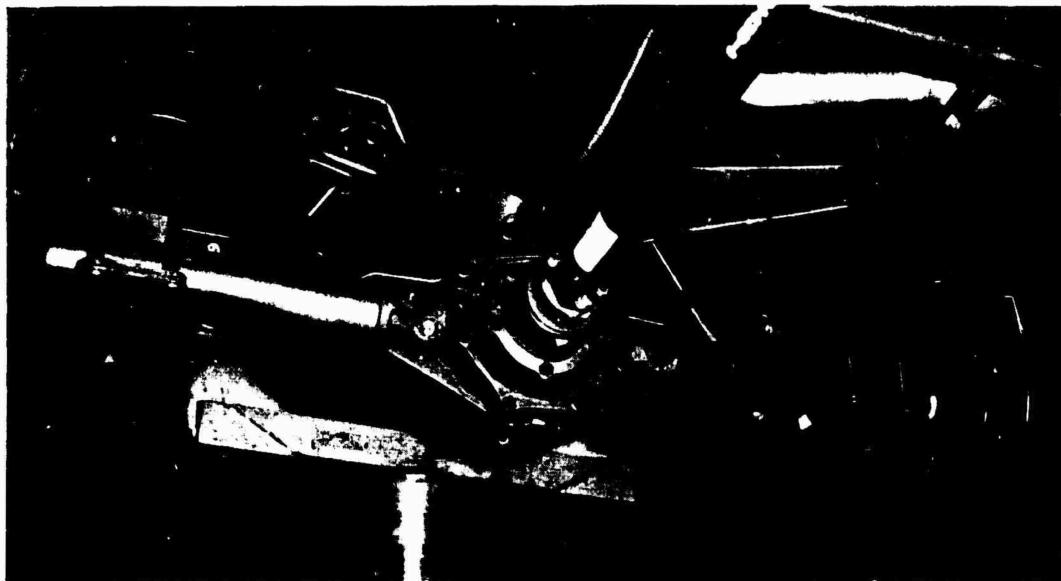


Figure 1.2-1: Solid Rear Axle Installation.

- c. Front Differential Carrier. Since it was desirable to maintain the front independent suspension, an independent differential carrier assembly was incorporated to utilize the maximum number of interchangeable parts with the new rear differential. The differential assembly and pinion-shaft bearing housing are interchangeable from front to rear differential carrier assemblies.
- d. Rear Suspension. The rear suspension coil springs were replaced by 4-leaf half-elliptic springs. Each spring assembly is symmetrical and held together by a center bolt and two clips, retaining three of the four leaves. The springs are attached to the outer frame rail brackets by pins at the front and shackles at the rear.

- e. Rear Shock Absorbers. New rear shock absorbers having approximately double the resistance in rebound of standard units to compensate for the additional unsprung weight were installed. They are mounted at their upper ends by bolts inside the redesigned rear frame cross member and at their lower ends to the back side of solid axle tubes (Figure 1.2-1).
- f. Front Suspension. Coil springs with a wire diameter of 0.647 inch to 0.653 inch replaced the standard spring having a wire diameter of 0.622 inch to 0.628 inch. Thus, the new springs had a higher spring rate.
- g. Front Shock Absorbers. New front shock absorbers using cross pin lower attachment instead of a separate mounting bracket and new designed insulators and washers at their top mountings were installed. Flanged nuts were utilized on the upper control arms to cross member attaching bolts.
- h. Transmission - Transfer Assembly. The transfer incorporates a fixed output flange at its rear output shaft (Figure 1.2-2). This flange prevents axial movement of the transfer output gear and bearings on the shaft when the flange is locked to the shaft by a locknut. Rearward movement of the shaft assembly is prevented by a combination bearing retainer and seal housing that bears against the rear bearing outer race. Forward movement is restricted by a snap ring on the rear bearing outer race that acts against the shoulder of the transfer case bore.



Figure 1.2-2: Transfer Case Rear Output.

- i. Propeller Shafts. The front propeller shaft is similar to the standard shaft, but is one inch shorter. The new rear propeller shaft incorporates a splined slip-joint assembly to provide for the variation in shaft length required by the rear suspension motion (Figure 1.2-2).
- j. Exhaust System. The configuration of the tail pipe between the muffler and the exhaust extension at the rear of the vehicle was revised to allow clearance for the rear axle and suspension components.
- k. Brake System. One flexible hose to the rear axle is used in place of the two hoses on a standard vehicle. The hose connects to a tee fitting attached to the top of the differential carrier. Steel tubes lead from the tee fitting to the rear wheel cylinders (Figure 1.2-1)

1.3 TEST OBJECTIVES

To determine the engineering performance and durability characteristics of a truck, utility, 1/4-ton, 4x4, M151, modified with a solid rear axle.

1.4 SUMMARY OF RESULTS

The outer longitudinal rails of the vehicle frame deformed in the areas of the rear axle bump stops during 9038 durability test miles. At this time reinforcements were added to the rails; however, severe deformation was again encountered during the remaining 11,093 test miles.

The lower durometer rear-axle bump stops installed during the test to reduce the harsh ride failed after 5569 and again at 2003 test miles.

After shallow-water fording of the vehicle, water was found in the rear wheel-bearing cavities.

The snap-ring groove of the the rear-axle pinion-rear shaft pilot failed.

During the final inspection, the endplay of the tranfer-case rear-output shaft was found to be excessive at 0.113 inch.

1.5 CONCLUSIONS

It was concluded that the truck, utility, 1/4-ton, 4x4, M151, modified with a solid rear axle, was unsatisfactory because of the following defects:

- a. Frame distortion at the rear axle bump stops (ref par. 2.11.3.7).
- b. Failure of the rear axle bump stops (ref par. 2.11.3.8).
- c. Harsher ride than standard M151A1 (ref par. 2.11.3.8).
- d. Lubricant being forced out of the rear-axle breather assembly (ref par. 2.11.3.5).
- e. Inadequate sealing between the rear-axle brake-backing plates and the axle tubes (ref par. 2.11.3.6).
- f. Failure of the rear-axle pinion-gear shaft pilot bearing (ref par. 2.11.3.5).
- g. Difficulty of replacing rear-axle wheel bearing seals and repacking bearings (ref par. 2.11.3.5).
- h. Excessive endplay of the transfer-case rear-output shaft (ref par. 2.11.3.2).
- i. Distortion of the front propeller shaft (ref par. 2.11.3.3).

1.6 RECOMMENDATIONS

Not applicable.

SECTION 2. DETAILS OF TEST

2.1 INTRODUCTION

The test vehicle (USA Reg No. 2J7110) arrived at Aberdeen Proving Ground on 12 April 1966.

After 9038 miles of durability testing, the test program was suspended for 52 days while the vehicle was returned to the production engineering contractor (PEC) for modification.

Drawbar pull and full-load cooling tests were deleted from the test program in accordance with AMCPM-GP, Teletype 12-4855 (Appendix III).

Upon completion of the test program the vehicle was returned to the PEC.

2.2 INITIAL INSPECTION AND LUBRICATION

2.2.1 Objectives

To assure that the test vehicle is in good mechanical condition, properly serviced, and ready for test.

2.2.2 Method

The vehicle was given an initial inspection and lubrication as prescribed in the technical publications for the vehicle.

2.2.3 Results

The vehicle was in good mechanical condition and only minor adjustments were made during the initial inspection and lubrication.

2.2.4 Analysis

Not applicable.

2.3 PRELIMINARY OPERATION

2.3.1 Objective

To operate the vehicle without payload for a prescribed number of miles to insure the proper seating of mating parts.

2.3.2 Method

The vehicle was operated on the paved course for a total of 500 miles as follows:

- a. Two hundred miles at speeds up to 30 mph.
- b. Three hundred miles at speeds up to 55 mph.

2.3.3 Results

Preliminary operation was completed without incident.

2.3.4 Analysis

Not applicable.

2.4 WEIGHT DISTRIBUTION

2.4.1 Objective

To determine the weight distribution of the vehicle at curb weight, with cross-country payload, and with highway payload.

2.4.2 Method

The weight distribution of the vehicle was obtained by the use of loadometers at each wheel.

2.4.3 Results

The vehicle weight distributions are shown in Table 2.4-I.

Table 2.4-I. Weight Distributions

Wheel Location	Curb Weight, lb	With Cross-Country Payload ^a , lb	With Highway Payload ^b , lb
Left front	670	750	740
Right front	670	740	770
Left rear	540	880	1050
Right rear	530	880	1060
Total	2410	3250	3620

^aRated cross-country payload including crew - 800 pounds.

^bRated highway payload including crew - 1200 pounds.

2.4.4 Analysis

Not applicable.

2.5 CENTER OF GRAVITY

2.5.1 Objective

To determine the center of gravity of the vehicle at curb weight.

2.5.2 Method

The center of gravity in three planes was determined by the suspension method.

2.5.3 Results

The center of gravity of the vehicle at curb weight was located 46-1/2 inches forward and 6 inches above the centerline of the rear wheel. The lateral location was on the vehicle centerline.

2.5.4 Analysis

Not applicable.

2.6 PHYSICAL DIMENSIONS

2.6.1 Objectives

To determine the minimum ground clearance and angles of approach and departure of the vehicle at curb weight, with cross-country payload, and with highway payload.

2.6.2 Method

The minimum ground clearance and angles of approach and departure were obtained by use of a measuring scale and protractor.

2.6.3 Results

The minimum ground clearances and angles of approach and departure of the vehicle are shown in Table 2.6-I.

Table 2.6-I. Physical Dimensions

Dimension	Curb Weight	With Cross-Country Payload	With Highway Payload
Minimum ground clearance	9-5/8 in.	9 in.	9 in.
Angle of approach	63 deg	62 deg	62 deg
Angle of departure	47 deg	43 deg	41 deg

2.6.4 Analysis

At the time of receipt, the vehicle at curb weight had approximately a 3-degree nose-down trim, which was distinguishable from a distance and which made the vehicle conspicuous in a group of standard M151A1 trucks.

2.7 TURNING RADII

2.7.1 Objective

To determine the minimum turning radii of the vehicle to the right and left.

2.7.2 Method

The minimum turning radii of the vehicle were obtained by measuring the circumferences of the circles described at the centerline of the outer front tire while making full 360-degree left and right turns.

2.7.3 Results

Minimum turning radii were 17.8 feet for both full right and left turns.

2.7.4 Analysis

Not applicable.

2.8 GRADEABILITY AND SIDE-SLOPE PERFORMANCE

2.8.1 Objectives

To determine maximum sustained speeds of the vehicle on longitudinal slopes of 5 through 60 per cent and operational characteristics of the vehicle on a 40 per cent side slope.

2.8.2 Method

The vehicle was operated on the longitudinal slopes at full throttle in the gear that provided maximum sustained speed. Road speed was obtained with a calibrated fifth wheel. Operational characteristics of the vehicle on a 40 per cent side slope were observed.

2.8.3 Results

Maximum sustained speeds of the vehicle on the longitudinal slopes are shown in Table 2.8-I.

Table 2.8-I. Longitudinal Slope Performance

Slope, %	Road Speed, mph	Gear
5	^a 40	3rd, 2-wheel drive
10	39	3rd, 2-wheel drive
15	36	2nd, 4-wheel drive
20	23	2nd, 4-wheel drive
30	15	2nd, 4-wheel drive
40	12	1st, 4-wheel drive
50	10	1st, 4-wheel drive
60	8.9	1st, 4-wheel drive

^aNot a sustained speed.

Operation of the vehicle on a 40 per cent side slope was satisfactory with respect to engine idle, restart, and stability. The fuel tank filler cap leaked when downgrade.

2.8.4 Analysis

Not applicable.

2.9 BRAKING

2.9.1 Objectives

To determine the maximum longitudinal slope on which the parking brake or service brakes would independently hold and control the vehicle in both ascending and descending attitudes.

To determine the distance required to stop the vehicle from a speed of 20 mph on a dry, hard, level road free from loose material.

2.9.2 Method

Vehicle stopping distances were determined by means of a fifth wheel and pousometer with transmission in neutral and maximum pedal effort braking from 20 mph.

2.9.3 Results

The parking brake and service brakes held the vehicle stationary in both ascending and descending attitudes on a 60 per cent longitudinal slope.

The average stopping distance of the vehicle from a speed of 20 mph was 20 feet.

2.9.4 Analysis

Vehicle braking was adequate.

2.10 STANDARD OBSTACLES

2.10.1 Objective

To determine if the vehicle could be operated over various standard obstacles without interferences between vehicle components or the vehicle and obstacle profile.

2.10.2 Method

The vehicle was visually observed while operating over the frame twister and through the simulated ditch.

2.10.3 Results

The vehicle operated satisfactorily over the frame twister and through the simulated ditch.

2.10.4 Analysis

Not applicable.

2.11 DURABILITY

2.11.1 Objective

To determine the durability characteristics of the vehicle.

2.11.2 Method

The vehicle was operated for a total of 20,000 miles by completing the following cycle four times.

Durability Cycle

<u>Course</u>	<u>Mileage</u>
Paved highway	1050
Belgian block	150
Level cross-country (Perryman No. 1)	1900
Hilly cross-country (Churchville)	1900
Total	5000

All operations were conducted with the following rated loads.

a. Cross-country. Eight hundred pounds including crew.

b. Highway. Twelve hundred pounds including crew.

Fifty per cent of all operations were with the following rated towed loads.

a. Cross-country. Fifteen hundred pounds.

b. Highway. Two thousand pounds.

The vehicle was shallow-water (21 inches) forded prior to starting operation, after 12,000 miles and at the completion of 20,000 miles.

2.11.3 Results

A summary of vehicle operation is shown in Table 2.11-I.

Table 2.11-I. Summary of Operations

<u>Course</u>	<u>Mileage</u>		
	<u>Without Towed Load</u>	<u>With Towed Load</u>	<u>Total</u>
Paved highway	2179	2106	4285
Belgian block	300	301	601
Level cross-country (Perryman No. 1)	3803	3800	7603
Hilly cross-country (Churchville)	3801	3794	7595
Total	10083	10001	20084

The over-all average fuel consumption was 11.0 mpg and average oil consumption was 3080 mpq.

A summary of incidents encountered during the test is contained in Appendix I. The most significant of these incidents are discussed according to functional group.

2.11.3.1 Group 04, Exhaust System. During vehicle operation, the cross-over section of the forward exhaust pipe was rubbing the front propeller shaft, resulting in a hole in the pipe. Upon replacement of the pipe, the static clearance between it and the shaft was 5/16 inch and, although there may have been contact, no holes developed in the pipe during the remaining 13,744 miles of operation.

2.11.3.2 Groups 07 and 08, Transmission - Transfer Assembly. After completion of the durability test, the endplay of the transfer rear output shaft was excessive at 0.113 inch.

2.11.3.3 Group 09, Propeller Shafts. After 7228 test miles, the rear propeller shaft was bent approximately 1/2 inch at the center. During modification by the PEC after 9038 test miles, a newly designed shaft with increased U-joint angularity and tube diameter was incorporated. Also, a rubber windup bumper was installed as shown in Figure 2.11-1 to prevent excessive windup of the rear axle.



Figure 2.11-1: Rear Axle Windup Stop.

During the final inspection after completion of the durability test, it was discovered that the front propeller shaft was slightly deformed (axis offset).

2.11.3.4 Group 10 Front Axle. A 1/2-inch crack developed in the left front lower control arm (Figure 2.11-2). The increased rate of the front springs could have contributed to this crack.



Figure 2.11-2: Crack in Left Front Lower Control Arm.

The front suspension cross member contained cracks at the mounting perch for the left lower control arm (Figure 2.11-3), in the area where the left rear bolt attaches it to the left longitudinal frame rail (Figure 2.11-4) and near both upper spring seats.



Figure 2.11-3: Crack in Front Suspension Cross Member at Front Mounting Perch for Left Lower Control Arm.



Figure 2.11-4: Crack in Front Suspension Cross Member in Area of Left Rear Attaching Bolt.

2.11.3.5 Group 11, Rear Axle. During operation, the rear differential lost lubricant through the differential carrier vent, at the rivets which attach the brake tube bracket to the carrier. After replacement of the vent at 6004 test miles, loss of lubricant through the vent was reduced. However, after 400 miles of operation, it was found that gear oil had been forced past the axle shaft inner seals and was contaminating the lubricant of the rear wheel bearings.

In accordance with directions from AMCPM-GP-TI (Appendix III), rear wheel bearings were not repacked at the normal 12,000 mile interval. However, after 17,801 test miles, rear-differential lubricant was leaking past the left and right rear-axle seals and wheel-bearing outer seals into the brake cavities. Replacement of the rear-axle wheel-bearing outer seals or repacking the bearings required an excessive amount of maintenance time, since the retaining collar must be broken and then the bearing must be pressed off the shaft (Figure 2.11-5). Extreme care must be exercised when pressing the bearing off and on the shaft to prevent bearing damage.

Lubricant leakage was excessive past the pinion-shaft seal after 17,801 test miles. Prior to removal of the pinion-shaft bearings and seal, the shaft endplay was measured and found to be 0.017 inch. Upon replacement of the seal, shaft endplay was adjusted to 0.000 inch.

Examination of the rear axle assembly after completion of the durability test disclosed that the snap-ring groove in the pinion shaft pilot bearing was broken off around the circumference of the bearing (Figure 2.11-6).

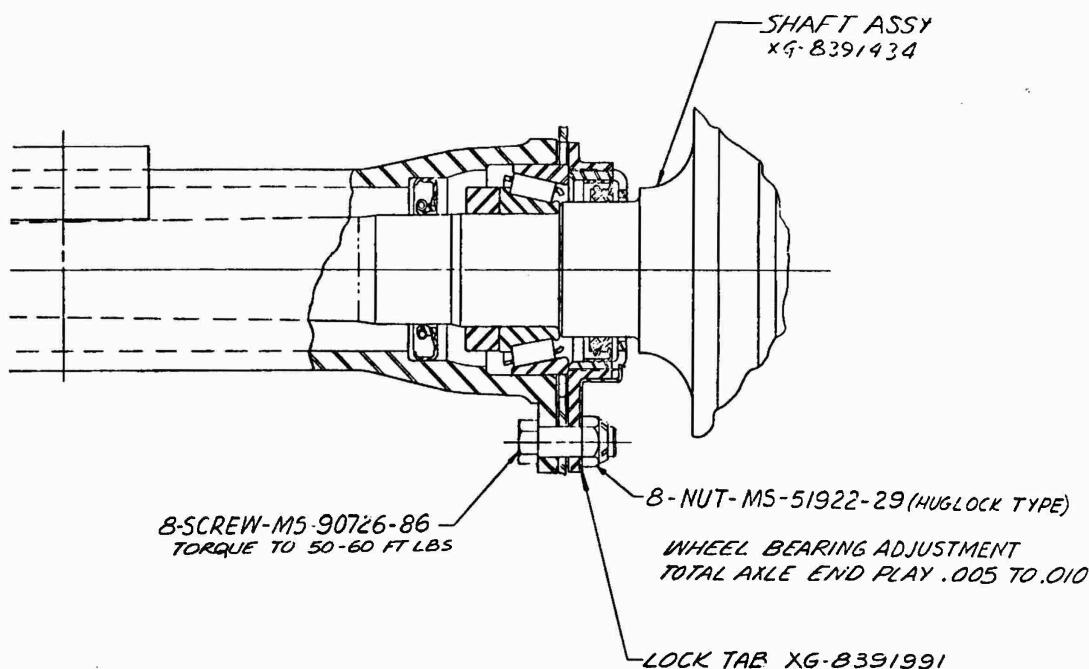


Figure 2.11-5: Axle-Shaft Assembly.

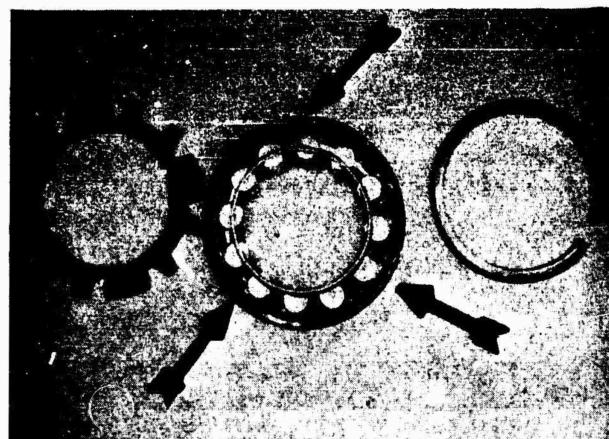


Figure 2.11-6: Snap-Ring Groove Broken Off Pinion-Shaft Pilot Bearing.

The roller ends of the pinion-shaft tapered roller bearing adjacent to the gear were excessively worn although the shaft endplay had not changed from the 0.000 inch adjustment made after 17,801 test miles. The ring gear to pinion gear backlash was 0.016 inch. Gear oil was leaking past the left and right axle-shaft seals and wheel-bearing outer seals which had been replaced at 17,801 test miles.

2.11.3.6 Group 12, Brakes. The gaskets used between the rear wheel brake-backing plates and the axle tubes were inadequate because the surface between the plate and tube is insufficient in the area of the wheel cylinder.

The brakes became very ineffective when gear oil entered the brake cavities.

2.11.3.7 Groups 15 and 18, Frame and Body. The outer longitudinal frame rails became excessively deformed (dented) at the areas where the rear-axle bump stops contact. The test was suspended and the vehicle was returned to the PEC for modification. The modification consisted of straightening the deformed frame rails and adding a reinforcement (Figure 2.11-7) inside each rail.



Figure 2.11-7: Reinforcement of Outer Longitudinal Frame Rail.

During final inspection after completion of the durability test, it was found that the frame rails were again excessively deformed in the areas of the rear-axle bump stops and a crack had developed in the right rail (Figures 2.11-8 and 2.11-9). The inner vertical panel of the right rear wheel well was buckled (Figure 2.11.10), thus indicating that the frame rail reinforcements were unsuccessful in preventing distortion.



Figure 2.11-8: Deformed Left Frame Rail in Contact Area of Rear-Axle Bump Stop.

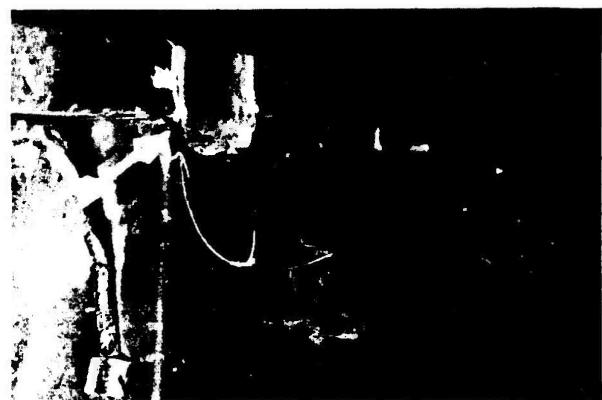


Figure 2.11-9: Deformed Right Frame Rail in Contact Area of Rear-Axle Bump Stop.

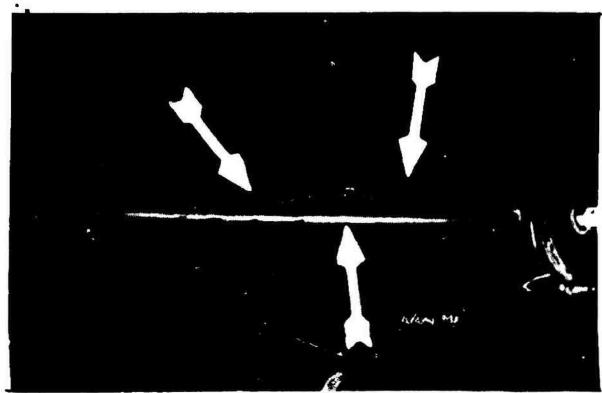


Figure 2.11-10: Buckled Vertical Panel of Right-Rear Wheel Well.

2.11.3.8 Group 16, Springs and Shock Absorbers. The newly designed rear-axle bump stops (lower durometer), installed during vehicle modification to reduce the harsh bump, split in the seam as shown in Figure 2.11-11 after 5569 test miles. A second set of bump stops were installed and had to be replaced after 2003 test miles as a result of deterioration as shown Figure 2.11-12.

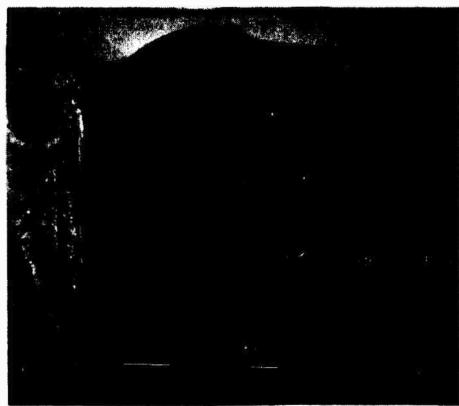


Figure 2.11-11: Split in Seam of Rear-Axle Bump Stop.



Figure 2.11-12: Deteriorated Rear-Axle Bump Stop.

SECTION 3. APPENDICES

APPENDIX I - EP SUMMARY SHEETS

TYPE OF INCIDENT				INCIDENT				INCIDENT			
SEQ. GRP	ITEM NO.	ABC NO.	TYPE	ITEM	PART NO.	PART NO.	VEH. CODE	PART NO.	PART NO.	VEH. CODE	REMARKS
01	47	B/M		<u>Engine</u>	96906-35298-88	9038	9111	Torque, 5 lb-ft. Tightened to 75 lb-ft.			
	52	B/M		Right engine-mounting bolt	8754320	11109	11199	Leaking at rear.			
	47-2	B/N		Valve push-rod gasket	9690-	12199	12289	Loose.			
	69	B/M		Right engine-mounting bolt	35298-88						
	79	B/D		Left engine-mounting bracket	8754540	15064	15154	Contained seven cracks.			
	80	B/D		Left-front engine mount	8754623	20131	20221	Cracked in two places.			
				Right-rear engine mount	8754676	20131	20221	Contained a crack.			
02	54	0		<u>Clutch</u>	Jnk						
	57	A/D		Clutch pedal	10900422	11444	11199	Installed experimental pedal.			
	57-2	A/D		Clutch-release bearing	10900422	11534	11534	Seized.			
	86	B/D		Clutch-release bearing	8687	20221	20221	Seized.			
				Clutch cross-shaft	10921908	20131	20221	Rough and dry.			
								Packing missing on one end and damaged on other end of shaft.			
03	7	B/M		<u>Fuel System</u>	7375020	998	0171	Fuel leaked past gasket			
	63	B/D		Fuel-tank cap gasket	Jnk	14607	14697	Stretched and leaking.			
				Carburetor diaphragm							

EP SUMMARY SHEET
(TECP 700-700
Interim Pam. 60-20)

PROJECT:

USATCOM PROJECT NO:

TYPE OF INCIDENT

A - DEFICIENCY B - DESIGN

B - SHORTCOMING C - MANUFACTURING

C - SUGGESTED IMPROVEMENT D - OTHER

S/N ITEM NO.	ITEM NO.	ITEM	INCIDENT		PART NO.	PART MILEAGE	VN Odom.	REMARKS
			INCIDENT	REMARKS				
04	28	B/M	<u>Exhaust System</u>		7331256	4542	4615	Hole worn in cross-over pipe due to rubbing front propeller shaft.
	28-2	0	Exhaust pipe		7331256	6404	6477	Replaced cross-over pipe.
	36	B/D	Exhaust-pipe clamp		Unk	7995	8068	Rear clamp on tail pipe loosened.
	36-2	B/D	Exhaust-pipe clamp		Unk	20131	20221	Second from rear clamp broke.
05	38	B/M	<u>Cooling System</u>		8754191	8433	8506	Front stud pulled out of rubber body.
	38-2	B/M	Upper radiator mount		8754191	2676	11199	Front stud pulled out of rubber body.
	85	A/M	Engine coolant fan		8342323	20131	20221	Cracked in two places.

TYPE OF DEFECTS

A - DEFICIENCY B - DESIGN
 B - SHORTCIRCUIT N - MANUFACTURE
 C - SUGGESTED REMOVAL O-Other

EP SUMMARY SHEET
 (TECP 700-700
 Interim Pam. 60-20)

PROJECT:

USATECOM PROJECT NO:

S/N. SOL. CAP. NO.	VEH. NO.	ARC. NO.	TYPE	ITEM	INCIDENT		PART NO.	PART MILEAGE	VEH. ODOM.	REMARKS
					ITEM	ITEM				
06			B/M	<u>Electrical System</u>						
	5	8	B/M	Wiring harness	Unk	Unk	677	750		Lower lead to horn loose.
			B/M	Alternator cooling fan	Unk	1431	1504	Loose due to cap screw loosening in end of armature shaft.		
	14	14	B/M	High-beam indicator lamp	154732	3239	3312	Burned out.		
	20	20	B/M	Ignition system	NA	3239	3312	Timing shifted from 6° to 9° BTDC.		
	26	26	B/M	Wiring harness	Unk	4247	4320	Lead damage by edge of hood.		
	32	32	0	Ignition-point set	7059538	6404	6477	Adjusted point gap from 0.012 inch to 0.020 inch.		
	33	0		Spark plugs	83557724	6404	6477	Adjusted plug gaps from 0.037 inch to 0.030 inch.		
	14-2	14-2	B/M	High-beam indicator lamp	154732	5669	8981	Burned out.		
	43	43	B/M	Turn-signal lamp	Unk	9038	9111	Left rear lamp burned out.		
	32-2	32-2	B/M	Ignition-point set	7059538	9038	9128	Replaced.		
	33-2	33-2	B/M	Spark plugs	83557724	9043	9133	Replaced.		
	58	58	B/M	Turn-signal lamp	Unk	12202	12292	Right front lamp burned out.		
	33-3	33-3	B/M	Spark plugs	83557724	3433	12569	Breaking down, replaced.		
	59	59	B/M	Oil-pressure sending unit	IS-24538-1	12530	12620	Replaced.		
	60	60	B/O	Oil-pressure gage	IS-24541-1	12914	13004	Replaced.		
	14-3	14-3	B/M	High-beam indicator lamp	154732	6807	15788	Burned out.		
	32-3	32-3	B/M	Ignition-point set	7059538	9011	18139	Replaced.		
	14-4	14-4	B/M	High-beam indicator	454732	4433	20221	Inoperative.		

TYPE OF INCIDENT

A - SERVICING

B - DESIGN

B - MANUFACTURE

C - MANUFACTURER INC.

EP SUMMARY SHEET
(TECP 700-700
Interim Pam. 60-29) PROJECT:
USATCOM PROJECT NO: _____

S/N CAT. ITEM	VIN NO.	ARC NO.	TYPE	INCIDENT		PART NO.	PART MILEAGE	VIN CODE	REMARKS
				ITEM	INCIDENT				
<u>Transmission</u>									
07	30	B/M	Transmission			-	4662	4735	Hot and seeping lubricant; tightened speedometer drive.
	56	A/M	Cluster gear	7536154	11444	11531			2-1/2 teeth of 3rd gear failed.
	65	B/D	Parking-brake drum-retaining screw	PS-35306-14513	14603	14603			Loose; tightened to 65 lb-ft.
	71	3/D	Transmission mounting bolts	PS-35306-17185	17275				Threads damage due to being loose.
	82	B/D	Shifter-shaft seal	88					
				7979499	20131	20221			Seal was leaking. End play of rear output shaft was 0.113 inch.
<u>Transfer Assembly</u>									
08	49	B/D	Rear output-flange lock nut	XG-8392	9038	9111			Torque, 50 lb-ft; tightened to 100 lb-ft.
	61	B/M	Front output-shaft seal	446					Leaking, replaced.
	75	B/D	Front and rear output-shaft seals	7996802	12914	13001			Leaking, replaced.
	76	B/D	Front output flange	7996802					
				8359974	18049	18139			Horn excessively.
<u>Propeller Shafts</u>									
09	35	A/D	Rear propeller shaft	XG-8391	7288	7361			Shaft was bent approximately 1/2 inch at the center.
	77	A/D	Front propeller shaft	926					Rear U-joint cross was brinelled.
	35-2	A/D	Rear propeller shaft	XG-8391	18049	18139			Front U-joint cross was brinelled.
	77-2	A/D	Front propeller shaft	687					Deformed.

ITEMS OF INSPECTION
A - INSUFFICIENCY **B - DESIGN**
C - INSUFFICIENT **D - MANUFACTURE**
E - SUGGESTED IMPROVEMENT

**EP SUMMARY SHEET
 (TECP 700-700
 Interim Pam. 60-20) PROJECT: _____**

USATCOM PROJECT NO: _____

ITEM NO.	VIN NO.	ARC NO.	TYPE	INCIDENT		PART NO.	PART MILEAGE	VIN NO.	REMARKS
				ITEM	ITEM				
10		3	B/M	<u>Front Axle</u>		NA	2	75	Toe-in incorrect. Installed in wrong position.
		4	B/M	Front-wheel alignment shims	8754402	8754403	2	75	
15	B/M			Left front-wheel bearing seal	9996801	3239	3312	Outer lip of outer seal deformed.	
16	B/M			Left front-wheel bearing seal	9996804	3239	3312	Outer lip of inner seal deformed.	
17	B/M			Right front-wheel bearing seal	9996804	3239	3312	Outer lip of inner seal deformed.	
21	B/M			Lower front control-arm mounting bolts	8754892	3239	3312	Torque, 15 to 25 lb-ft; tightened to 55 and 70 lb-ft.	
27	B/M			Steering-stop bolt	16-35297-87	4542	4615	Missing.	
29	B/D			Front differential fill-plug gasket	-	4662	4735	Copper gasket installed in place of synthetic gasket.	
48	B/D			Upper front control-arm mounting bolts	XG-8392	9038	9111	Torque, 45 to 80 lb-ft; tightened to 100 lb-ft.	
15-2	B/D			Front-wheel alignment shim	453	8754402	10165	Missing from left rear side.	
					8754403	8754404	10255		
51	B/M			Left-front upper ball joint	8754861	10722	10812	Stud-nut loose; all four.	
64	B/D			Left-front lower-control arm	8754415	14513	14603	One-half inch crack.	
72	A/O			Left-front wheel bearing	1536131	17538	17628	Replaced as a result of EPR 16-2	
16-2	A/D			Left-front wheel bearing seal	1996804	14316	17628	Inner seal allowed dirt and water into bearings.	
78	A/D			Right-front upper ball joint	8342319	18049	18139	Ball joint and its seals were unserviceable.	
16-3	A/D			Left-front wheel-bearing seal	1996804	2593	2C221	Inner seal allowed water into bearings.	
88	A/D			Front cross member	8754456	20131	20221	Cracks.	

THE END

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- **MANUFACTURERS**
- **SELLERS**
- **IMPORTERS**
- **SELLERS**
- **MANUFACTURERS**

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**EP SUMMARY SHEET
(TECP 700-700
Interim Pam. 60-20)**

UNIVERSITY PRESS

S/N. CAR.	VIN. NO.	AC. NO.	MILE. NO.	ITEM	INCIDENT		PART NO.	PART MILEAGE	VH Odom	REMARKS
					INCIDENT	ITEM				
11	9	B/D		<u>Rear Axle</u>			XG-8391	1475	1548	Losing lubricant at fill and drain
	9-2	B/D		Rear-axle assembly			290	2526	2599	plugs, and pinion seal.
	9-3	B/D		Rear-axle assembly			290	4527	4600	Continued loss of lubricant.
	9-4	A/D		Rear-axle assembly			290	4629	4702	Loss of lubricant increasing.
	9-5	A/D		Rear-axle assembly			XG-8391	4662	4735	Plug gaskets replaced, tube with
	9-6	B/D		Rear-axle assembly			290	4935	5008	vent installed.
	9-7	B/D		Rear-wheel bearings			XG-8391	NA	6477	Lubricant seepage at brake line
	73	A/D		Rear-wheel bearing seals			908	17801	17891	mounting bracket.
	74	A/D		Rear-differential pinion-shaft seal			XG-8392	17801	17891	CO-90 found in rear wheel bearings.
	83	A/D		Rear-differential pinion-shaft pilot bearing			075	20131	20221	Gear oil was leaking past the inner axle seals and the outer wheel bearing seals into the brake cavities.
	73-2	A/D		Rear-wheel bearing seals			XG-8391	920	2330	Left and right shaft end plays were
	87	B/O		Rear-axle shafts			908	20131	20221	0.043 inch and 0.049 inch.

ITEM OR ITEMIZE Q - REPAIRS N - REPAIRS
B - SUBSTITUTION M - MANUFACTURE
C - SUBSTITUTE EQUIPMENT O - OTHER

EP SUMMARY SHEET
 (TECP 700-700
 Interim Pam. 60-20) PROJECT: _____

S/N. ITEM CAT.	ITEM NO.	ARC NO.	TYPE	REASON		PART NO.	PART NOMEX	VEN OON	REMARKS
				ITEM	ITEM				
<u>Brakes</u>									
12	10	A/D	Rear-wheel backing plate	7025867	1711	1784	Inadequate gasket surface between plate and axle tube.		
	23	0	Service brakes	NA	4027	4100	Cleaned and adjusted.		
	23-2	0	Service brakes	NA	6404	6477	Adjusted.		
	10-2	B/D	Rear-wheel backing plates	7025867	6404	6477	Backing-plate gaskets deteriorated.		
	34	0	Parking brake	Unk	6404	6477	Adjusted.		
	34-2	0	Parking brake	Unk	9043	9133	Adjusted.		
	55	0	Brake pedal	Unk	-	11199	Installed experimental pedal.		
	66	B/O	Service brakes	Unk	14564	14644	Replaced all brake shoes.		
	66-2	B/O	Service brakes	Unk	3247	17981	Replaced rear-wheel brake shoes.		
<u>Wheels, Hubs, Drum</u>									
13	13	A/M	Inner tube	45-353927	3005	3074	Slow leak; left front.		
	41	0	Tire, 7.00 x 16, lightweight	8					
	42	A/M	Tire, 7.00 x 16, lightweight	45-35388- 93	9036	9109	Rear tires replaced.		
	41-2	A/O	Left rear tier	45-35388- 93	9038	9111	Left front tire cut in tread.		
	41-2	0	Left rear tire	45-35388- 93	1771	10897	Punctured by stone; replaced.		
	41-3	0	Tire, 7.00 x 16, lightweight	45-35388- 93	8433	1943	Replaced due to break.		
	42-2	0	Tire, 7.00 x 16, lightweight	45-35388- 93	10432	19541	Replaced.		
				45-35388- 93	11183	20221	Front tire worn out.		

Types of Defects

A - DEFECTIVE B - DEFECT
 B - DEFECTIVE N - MANUFACTURE
 C - SHODDY/SHABBY DEFECTIVE D - OTHER

EP SUMMARY SHEET
 (TECP 700-700
 Interim Pan. 60-20)

PROJECT: _____
 STATE/TECP PROJECT NO.: _____

S/N. Defect No.	W/H No.	A/C No.	TYPE	DEFECT		PART NO.	PART RELEASE	W/H GIVEN	REMARKS
				ITEM	ITEM				
14		12 84	B/H B/O	<u>Controls</u>		Unk Unk	2433 20131	2506 20221	Missing. Cracked.
15		40 40-2 62	B/D A/D B/O	<u>Frame and Brackets</u>		NA NA Unk	8761 9038 3500	8834 9111 13628	Deformed in areas of rear axle bump stops. Deformation increased and test was suspended. Loose.

TYPES OF INCIDENTS

A - DEFICIENCY

D - DESIGN

B - SHORT COMING

N - MANUFACTURING

C - SUGGESTED IMPROVEMENT

O-Other

EP SUMMARY SHEET
(TECP 700-700

Interim Pam. 60-20)

PROJECT:

USATECON PROJECT NO:

SL. GRD.	VEN. ID.	ARC. ID.	TYPE	ITEM	INCIDENT		PART NO.	PART MILEAGE	VEN. ODOM	REMARKS
					ITEM	ITEM				
16		18	B/D	Left-rear shock-absorber lower mounting bolt			3239	3312	Torque, 25 1b-ft; tightened to 60 1b-ft.	
		19	B/D	Front shock-absorber cross-pin mounting bolts			3239	3312	Torque, 10 to 18 1b-ft; tightened to 40 1b-ft.	
		31	B/D	Rear spring-mounting bolt	MS-51105-	6404	6477		Right front bolt torque, 25 1b-ft; tightened to 110 1b-ft.	
		44	B/D	Right-front shock absorber	447				Cross-pin mounting bolt broke.	
		44-2	O	Right-front shock absorber	XG-8391	9038	9111		Bushing shifted on pin.	
		19-2	A/D	Left-front shock-absorber cross-pin mounting bolts	958		-	9111	Installed replacement shock absorber.	
		44-3	B/D	Left-front shock absorber	XG-8391	10084	10174		One bolt missing; one bolt sheared.	
		44-4	A/M		958				Low resistance.	
		44-5	O	Right-front shock absorber	XG-8391	3413	11534		Nut on lower end of piston rod came loose.	
		44-6	B/D		XG-8391	-	12541		Installed replacement shock absorber.	
		44-7	O	Rear shock absorbers	959				Leaking.	
		44-8	B/D	Left-front shock absorber	XG-8391	13032	13122			
		68	B/D	Rear-axle bump stops	959	-	13122		Both replaced.	
		68-2	B/D	Rear-axle bump stops	XG-8391	3086	14620		Threaded portion of upper stud was bent.	
		44-9	B/D	Right-rear shock absorber	321	5569	14697		Both stops split.	
					XG-8391	2003	16700		Both stops split.	
					959	7099	20221		Lack of resistance and pitting chrome.	

TYPE OF INCIDENT
 A - DEFICIENCY D - DESIGN
 B - SHORTCOMING N - MANUFACTURING
 C - SUSPECTED DEFICIENCY

EP SUMMARY SHEET
 (TECP 700-700
 Interim Pam. 30-20)

PROJECT:

USATECOM PROJECT NO:

SRL C/S#	VEN ID#	ARC NO.	TYPE	ITEM	INCIDENT		PART NO.	PART MILEAGE	VEH ODOM	REMARKS
					ITEM	ITEM				
17	37	B/M		<u>Hood and Fenders</u>			96906-35335-18	8201	8274	Front screw broke.
18				<u>Body and Cab</u>						
	6	B/D		Floor-panel drains	Unk	677	750			Ineffective.
	22	A/D		Floor panel	Unk	3854	3927			Panel above muffler too hot.
	39	B/M		Spare-tire mounting bracket	Unk	8511	8584			Cracked and bolt pulled out.
	67	B/M		Spare-tire mounting bolt	Unk	5554	14682			Sheared off.
	67-2	B/N		Spare-tire mounting bolt	Unk	-	-			Lug nut could not be used since replacement bolt had standard threads.
	70	B/D		Floor panel	Unk	17185	17275			3-inch crack in body at rear of transmission tunnel cover.
	81	B/D		Body and frame	Unk	20131	20221			Condition was unsatisfactory.

TYPE OF INCIDENT

A - DEFICIENCY D - DESIGN

B - SUBSTONIC H - MANUFACTURING

C - SUGGESTED DEVELOPMENT O - OTHER

EP SUMMARY SHEET
(TECP 700-700
Interim Pam. 60-20)

PROJECT:

USATEC/M PROJECT NO:

S/N GRP	VEH NO.	ARC NO.	TYPE	INCIDENT		PART NO.	PART MILEAGE	VEH ODOM	REMARKS
				ITEM	INCIDENT				
<u>Miscellaneous Accessories</u>									
22		11	B/M	Left door	8754975	2433	2506		Vertical zipper stuck open.
		24	0	Vacuum pump	-	4247	4320		Replaced with modified pump (XG-8392431).
		25	0	Vacuum pump to intake-manifold tube	8754551	4247	4320		Replaced with transparent tube.
		45	B/D	Rear-seat assembly	Unk	9038	9111		Legs cracked were they are welded to frame.
		46	B/D	Right rear tie-down shackle		9038	9111		Strikes rear end of spring.
		53	0	Vacuum pump	XG-8392	-	11199		Installed experimental pump.
		53-2	B/D	Vacuum pump	431	9022	20221		Oil was found on both sides of diaphragm.
				<u>Miscellaneous</u>					
		1	-	Receipt of vehicle	-			0	73
		2	-	Start of test	-			0	73
		3	-	Receipt of vehicle after modification	-	9038	9128		

APPENDIX II - PHOTOGRAPHS

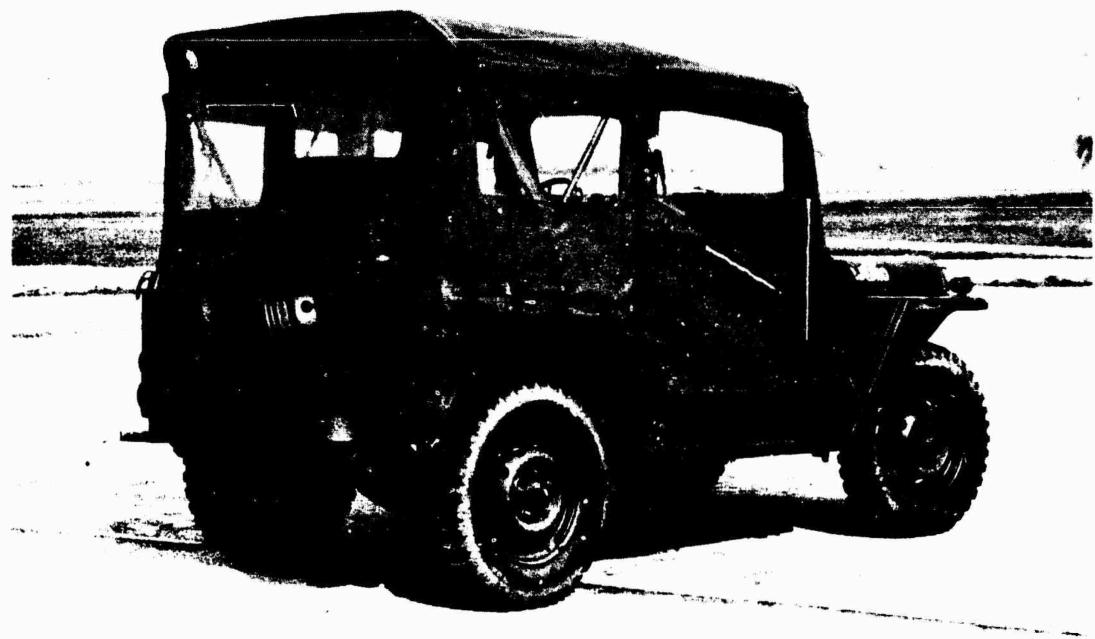


Figure II-1, 1928-66: Three-Quarter Right Rear View.



Figure II-2, 1926/66: TOP: Rear View. BOTTOM: Front View.

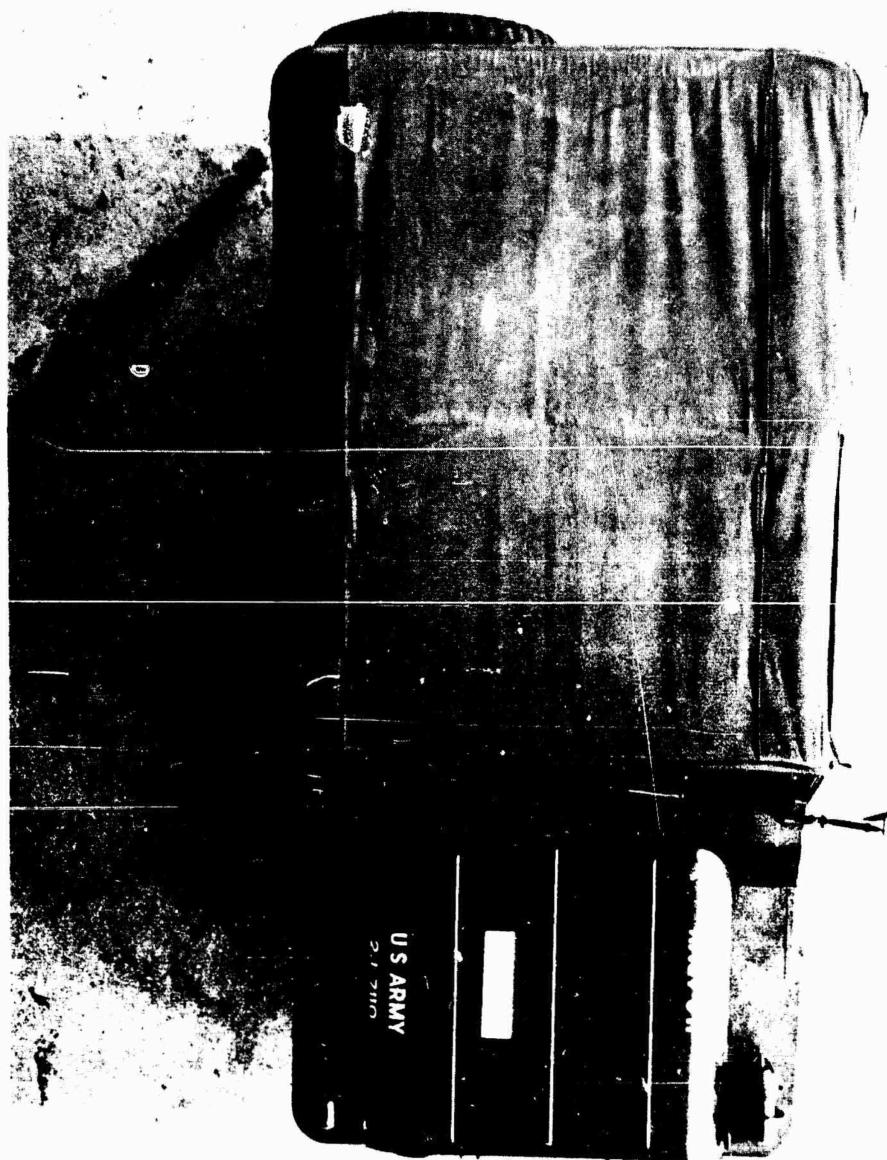


Figure II-3, 1925/66: Top View.

APPENDIX III - CORRESPONDENCE

PROCUREMENT/WORK DIRECTIVE (AMCR 11-15)				1. TRANSMISSION CONTROL NUMBER K2-00-001	2. PAGE 1 OF 4 PAGES	3. PRIORITY 98
4. TO: Aberdeen Proving Ground ATTN: STAMP-DS-TU Aberdeen, Maryland				5. APPROVED BY: DENNIS MEDREA JR. Ch., Prog Mgt Br, GPV	6. BASIC FACT CODES: A31315632	7. DATE 6048
8. FROM: Project Manager, GPV ATTN: AMCPM-GP-MPM Warren, Michigan 48090				9. AUTHORIZED BY: C. F. NOWOSIELSKI Ch. Prog Mgt Div, GPV	10. PROJECT NO./CATEGORY CODE: 11E3 001 1	
11. CMS TITLE/ITEM NOMENCLATURE: Truck, Utility, 1/2 Ton, 4x4, M151				12. CUSTOMER ORDER NUMBER: A1-6-13310-A1-30	13. FROM: 30-6-GP794-01-30-K2	
14. AMCMIS CODE: 4510.04.3101.1		15. ACCOUNTING CLASSIFICATION: 21X2030 664-3000 P4510 20-113		16. DATE DISP. CV-1-13353 6 048		
17. QUANTITY ON ORDER:		18. TARGET DATE FOR OBLIGATION:		19. LOCAL USE:		
20. QUANTITATIVE AND CHANGE DATA						
ELEMENT	U/M	QUANTITY	UNIT PRICE		TOTAL PRICE	
a. PRIOR		N/A			NONE	
b. TOLERANCE USED						
c. INCREASE						
d. DECREASE						
e. CURRENT						
f. TOLERANCE						
21. REPORT CODE: A		22. TYPE OF FINANCING: 6		Funds Certified		
23. DESCRIPTION OF WORK AUTHORIZED/SPECIAL INSTRUCTIONS/INCORPORATIONS						
<p>The purpose of this order is to provide Program and Funding Authority to conduct a Product Improvement Test on one (1) each Truck, Utility, 1/2 Ton, M151 (with solid axle rear suspension) in accordance with the following test program:</p> <p style="text-align: center;"><u>Test Program</u></p> <p>1. Testing shall be conducted as follows:</p> <ol style="list-style-type: none"> OPM 60-25 - Vehicle Inspection. TECP 700-700 - (Interim Pamphlet 60-30) - Preliminary Operation OPM 60-80 - Gradeability and Side Slope Performance <p style="text-align: right;">(Continued on AMC Form 1006A) <i>X8</i></p> <p>23-1 This is <input checked="" type="checkbox"/> Project Order, Fixed Price; <input checked="" type="checkbox"/> Project Order, Cost Reimbursable; <input type="checkbox"/> Intra-Army Order for Reimbursable Work or Service.</p> <p>The work or services will be performed as ordered herein. Expiration date of this order: <u>31 December 1966</u></p> <p>23-2 The above terms and conditions are satisfactory and are accepted.</p>						
Typed Name & Title of Accepting Officer				Signature		Date
24. PACKAGING, PACKING AND MARKING SHALL BE IN ACCORDANCE WITH: Funds cited are available						
25. DISTRIBUTION PATTERN:				BASIC FACT CODE:		
DEPOT	DOC IDENT	SI	U/I	QTY	CUST DOC NUMBER	STOCK NUMBER
s	s	s	s	s	s	s
UNIT PACK:		INTER PACK:		CONSIGNEE:		
P & P LEVEL:		PACKING LEVEL:				
o	d	o	d	o	d	o
o	d	o	d	o	d	o
III-1						

CONTINUATION OR SUPPORTING SHEET
(AMC REG)

PAGE	2	OF	4	PAGES
PRON	30-6-C	94	AMCNS CODE	
	01-30-R2			4510.04.3101.1

- d. Weight Distribution
- e. TECP 700-700 (Interim Pamphlet 60-65) - Center of Gravity
- f. Execute a sufficient number of Panic Stops to determine braking stability
- g. TECP 700-700 - (Interim Pamphlet 60-50) - Standard Obstacles
Operate modified vehicle unloaded and with rated payload over standard obstacle courses appropriate for this class vehicle.
- h. Draw Bar Pull and Full Load Cooling
- i. The following test cycle should be repeated four times for a total of 20,000 miles:
 - (1) Paved Highway - 1,050
 - (2) Level Cross-Country ~ 1,900
 - (3) Hill Cross-Country - 1,900
 - (4) Belgium Block - 150

2. Reporting on tests shall be as follows:

- a. Problems or difficulties will be reported as they occur by telephone and teletype to AMCPM-GP-TLV (ATTN: Mr. M. E. Burcz and/or Mr. E. E. Woessner, Ext 648/492).
- b. Interim reports will be periodically forwarded to the Project Manager on the progress of the testing.
- c. A formal report will be prepared within thirty (30) days after completion of the test.
- d. Distribution list for final report is as follows:

Commanding General
US Army Test and Evaluation Command
Aberdeen Proving Ground, Maryland 21005
ATTN: AMSTE-BF - 1 copy
AMSTE-TA - 1 copy

CONTINUATION OR <u>1</u> ORTING SHEET (AMC REG 21-21)	PAGE	3	OF	4	PAGES
	PRON	30-6	P794	AMCNS CODE	4510.04.3101.1
01-30-K2					

Project Manager's Office,
General Purpose Vehicles
Michigan Army Missile Plant
Warren, Michigan 48090
ATTN: AMCPM-GP-TLV - 10 copies

Commanding General
US Army Tank-Automotive Center
Warren, Michigan 48090
ATTN: SMOTA-RTT - 20 copies

Commanding Officer
Yuma Proving Ground
Yuma, Arizona 85364 - 1 copy

Commanding Officer
Jefferson Proving Ground
Madison, Indiana 47251 - 1 copy

Commanding Officer
Erie Proving Ground
Port Clinton, Ohio 43452 - 1 copy

Commanding Officer
US Army Arctic Test Center
APO Seattle, Washington 98733 - 1 copy

Commanding Officer
Aberdeen Proving Ground
Aberdeen Proving Ground, Maryland 21005
ATTN: STEAP-TL - 2 copies

Commander
HQ, Defense Documentation Center for Scientific
and Technical Information
Cameron Station
Alexandria, Virginia 22314
ATTN: Document Service Center - 20 copies

Ford Motor Company
Special Military Vehicles Operations
P.O. Box 2053
Dearborn, Michigan
ATTN: Mr. C. Mauch - 10 copies

CONTINUATION OR SUPPLYING SHEET (AMC REG 1-21)	PAGE 4 OF 4 PAGES		
	PRON 30-6-7794- 01-30-K2	AMCNS. CODE 4510.04.3101.1	

3. Replacement parts for the test vehicles will be obtained through normal supply lines by the testing agencies, with the exceptions of those special test parts which are not in the supply system plus any standard component that cannot be obtained from supply.

4. Testing should be conducted on a 24-hour basis, 7 days a week.

5. It is requested that failed vehicle components be sent to the Ford Motor Company, Special Military Vehicles Operations, ATTN: Mr. H. J. Zaidel, 2001 Beech Daly Road, Dearborn Heights, Michigan, for evaluation and consideration of possible engineering changes. Disposition instructions for the test vehicles will be furnished during or after completion of tests.

PROCUREMENT/WORK DIRECTIVE (AMCR 11-15)		1. TRANSMISSION CONTROL NUMBER K2-03-0004	2. PAGE 1 OF 1 PAGES	3. PRIORITY 98
4. TO: CG, USATECOM Aberdeen Proving Ground ATTN: STEAP-DS-TU Aberdeen, Maryland 5. FROM: Project Manager ATTN: AMCPM-CP-MPM Warren, Michigan 48090		5. APPROVED BY DENNIS MEDREA, Jr. Ch, ProgMgtBr, GPV 6. BASIC FACT CODE: A31315633 PROJECT NO./CATEGORY CODE: 11E3 001 1	7. DATE 6078	
11. CMS ITEM/ITEM NOMENCLATURE: Truck, Utility, 1/2T, 4x4, M151		12. CUSTOMER ORDER NUMBER: A1-6-13310-A1-30	13. PRON: 30-6-CP794-02-30-K2	
14. AMCRS CODE: 4510.04.3101.1		15. ACCOUNTING CLASSIFICATION: 21X2030 664-3000 P4510 20-113	16. DATE DISP: 6078	
17. QUANTITY ON ORDER:		18. TARGET DATE FOR OBLIGATION:	19. LOCAL USE:	
20. QUANTITATIVE AND CHANGE DATA				
ELEMENT	U/M	QUANTITY	UNIT PRICE	TOTAL PRICE
a. PRIOR		N/A		
b. TOLERANCE USED				
c. INCREASE		N/C		
d. DECREASE				
e. CURRENT		N/A		
f. TOLERANCE				NONE
21. REPORT CODE:	A	22. TYPE OF FINANCING:	6	Funds Certified
23. DESCRIPTION OF WORK AUTHORIZED/SPECIAL INSTRUCTIONS/INCLOSURES: The purpose of this amendment is to provide the following list of major components applicable to the Product Improvement Test of one (1) each Truck, Utility, 1/2 Ton, M151 (with solid axle rear suspension):				
<u>List of New Major Components</u> <ul style="list-style-type: none"> (1) Solid Rear Axle Assembly (2) Front Differential Assembly (3) Front Propeller Shaft Assembly (4) Rear Propeller Shaft Assembly (5) Transfer Gear Case Assembly (6) Rear Leaf Springs (7) Muffler Tailpipe (8) Front and Rear Shock Absorbers (9) Front Coil Springs (10) Body Assembly (11) Rear Brake Line 				
23-1 This is a <input checked="" type="checkbox"/> Project Order, Fixed Price; <input checked="" type="checkbox"/> Project Order, Cost Reimbursable; <input checked="" type="checkbox"/> Intra-Army Order for Reimbursable Work or Service. The work or services will be performed as ordered herein. Expiration date of this order: 31 DEC 1966				
23-2 The above terms and conditions are satisfactory and are accepted.				
24. Typed Name & Title of Accepting Officer		Signature		Date
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OFFICE OF THE PROJECT MANAGER
GENERAL PURPOSE VEHICLES
UNITED STATES ARMY MOBILITY COMMAND
WARREN, MICHIGAN 48090

AMCPM-GP-TLV

5 April 1966

SUBJECT: Product Improvement Test of Truck,
Utility, 1/4 Ton, 4x4, M151 (Solid
Axle Rear Suspension)

TO: Commanding Officer
Aberdeen Proving Ground
ATTN: STEAP-DS-TU, Mr. D. Liechty
Aberdeen, Maryland

Delete the distribution list for reporting
test results in Work Directive PRON 30-6-GP794-
01-30-K2, and replace it with the following
distribution:

a. Distribution list for formal report:

Project Manager's Office,
General Purpose Vehicles
Michigan Army Missile Plant
Warren, Michigan 48090
ATTN: AMCPM-GP-TLV - 20 copies

Commanding General
U. S. Army Tank-Automotive Center
Warren, Michigan 48090
ATTN: SMOTA-RTT - 2 copies

Commanding Officer
Yuma Proving Ground
Yuma, Arizona 85364 - 1 copy

AMCPM-GP-TLV

5 April 1966

SUBJECT: Product Improvement Test of Truck,
Utility, 1/4 Ton, 4x4, M151 (Solid
Axele Rear Suspension)

Commanding Officer
Aberdeen Proving Ground
Aberdeen Proving Ground, Maryland 21005
ATTN: STEAP-TL - 2 copies

Commander
HQ, Defense Documentation Center for Scientific
and Technical Information
Cameron Station
Alexandria, Virginia 22314
ATTN: Document Service Center - 20 copies

Commanding General
U. S. Army Test & Evaluation Command
Aberdeen, Maryland 21005
ATTN: AMSTE-BB - 1 copy and
ATTN: AMSTE-TA - 1 copy

Commanding Officer
U. S. Army Armor Board
Fort Knox, Kentucky
ATTN: STEBB-GT, Maj. Sterling - 1 copy
Lt. Cole - 1 copy

b. Distribution list for interim and equipment
failure reports:

Project Manager's Office,
General Purpose Vehicles
Michigan Army Missile Plant
Warren, Michigan 48090
ATTN: AMCPM-GP-TLV - 10 copies

AMCPM-GP-TLV

5 April 1966

SUBJECT: Product Improvement Test of Truck,
Utility, 1/4 Ton, 4x4, M151 (Solid
Axle Rear Suspension)

Commanding General
U. S. Army Test & Evaluation Command
Aberdeen, Maryland 21005
ATTN: AMSTE-BB - 1 copy

Commanding Officer
U. S. Army Armor Board
Fort Knox, Kentucky
ATTN: STEBB-GT, Maj. Sterling - 1 copy
Lt. Cole - 1 copy

FOR THE PROJECT MANAGER:

Marketa Hayton
for LOUIS MORTENSON
Chief, Technical Management Division

Copies furnished:
AMSTE-BB

COPY/es

NNNNZCZCARK784EUA432YEA777

RR RUEPARA

DATE: 10 JUN 66
ACTION: D&PS

DE RUCDGBB 36M 1601916

ZNR UUUUU

R 191900Z

FM PROJ MGR CPV MICH ARMY MISSILE PLANT WARREN MICH

TO RUEPARA/CO ABERDEEN PROVING GROUND MD

INFO RUEPARA/CG US ARMY TEST & EVALUATION COMMAND ATTN AMSTE-NB

COL SNEIDER APC MD

BT

UNCLAS TT6-4887 FOR STEAP-DS-TU, MR. LIECHTY FROM AMCPM-GP-T

SUBJ: PRODUCT IMPROVEMENT TEST OF M151A1 TRUCK MODIFIED WITH
SOLID REAR AXLE

1. IT IS REQUESTED THAT VEHICLE 2J7110 (M151A1) BE SHIPPED TO
FORD MOTOR CO., SPECIAL MILITARY VEHICLES OPERATIONS, 2001 BEECH
DALY RD, DEARBORN HEIGHTS, MICH, ATTN: MR. F. AVEY, AS SOON AS
POSSIBLE. SHIP THE VEHICLE BY COMMERCIAL TRUCK CARRIER COD,
FORD MOTOR CO.

2. THE PURPOSE OF THIS ACTION IS TO PERFORM THE NECESSARY REPAIRS
TO ALLOW CONTINUATION OF DURABILITY TESTING OF THE VEHICLE

BT

NNNNZCZCARK

COPY/es

NNNZCZCARK 377EUA823YEC3#8

RR RUEPARA

DATE: 9 AUG 66
ACTION: D&PS

DE RUGDGBB 18M 22#1816

ZNR UUUUU

R #81735Z AUG 66

FM PROJ MGR GPV MICH ARMY MISSILE PLANT WARREN MICH

TO CO ABERDEEN PROVING GROUND MARYLAND

BT

UNCLAS S-4566 FOR STEAP-DS-TU, D. LIECITY FROM AMCPM-GP-T

SUBJECT: SOLID AXLE TEST PROGRAM

IT IS REQUESTED THAT NO LUBRICATION OF THE SOLID AXLE WHEEL
BEARING BE ACCOMPLISHED FOR THE DURATION OF THE TEST. THIS REQUEST
DOES NOT NEGATE REPLACEMENT OF THE WHEEL BEARINGS OR ON THE
TEST VEHICLE WHEN NECESSARY.

BT

COPY/es

NNNN0ZCAFA933

RTTU JAW RUCIFDA5224 3361424-UUUU--RUEOFAA.

ZNR UUUUU

DATE: 2 DEC 66

R 021420Z DEC

ACTION: DGPS

INFO: INSTAL SUP
TRANSP

FM PROJ MGR GPV MAMP WARREN MICH

TO RUEOFAA/CO DEVELOPMENT & PROOF SERVICES APG MD

INFO RUEOFFA/CG USATECOM APG MD

BT

UNCLAS TT12-4855 FOR DGPS, STEAP-DS-TU, MR. D. LIECHTY;

USATECOM, AMSTE-BB, MR. C. WATERS

SUBJECT CLN PRODUCT IMPROVEMENT TEST OF TRUCK, UTILITY

1/4 TON, 4X4, M151A1 (MODIFIED WITH SOLID REAR AXLE), VEHICLE NO. 2J7110

1. THIS OFFICE AUTHORIZES DELETION OF THE FULL LOAD COOLING
AND THE DRAW BAR PULL TESTS FROM THE TEST DIERCTIVE.

2. AT COMPLETION OF THE TEST, IT IS REQUESTED THAT THE TEST
VEHICLE BE SHIPPED TO FORD MOTOR CO., SPECIAL MILITARY VEHICLES
OPERATIONS, 2001 BECCI DALY RD, DEARBORN HEIGHTS, MICH., ATTN CLN
MR. F. AVEY. ALSO, IT IS REQUESTED THAT THE VEHICLE BE RETURNED IN
AN AS IS CONDITION AND NO REPAIRS BE MADE.

3. IN ADDITION, ALL SPARE PARTS PECULIAR TO THE TEST VEHICLE
ARE TO BE SHIPPED TO THE ABOVE ADDRESS

BT

AD Accession No.
Development and Proof Service, Aberdeen Proving Ground, Md. 21005
Final Report of USATECOM Project No. 1-6-4030-12, Product Improvement Test of Truck,
Utility, 1 1/4-Ton, 4x4, M151, Modified with Solid Rear Axle, March 1967
RDT&E Project No. Not Available, Report No. DPS-2309
Author C. M. Bryzek, Jr.
Secondary distribution controlled by the Project Manager
54 pages, 18 illustrations

Unclassified Report

A product improvement test was conducted on a truck, utility, 1/4-ton, 4x4, M151, modified with solid rear axle, at Aberdeen Proving Ground (APG) from 12 April to 30 December 1966. The purpose of this test was to determine the engineering performance and durability characteristics of the vehicle. The vehicle was subjected to limited engineering performance tests and 20,000-mile durability test. It was concluded that the M151 modified with solid rear axle was unsatisfactory due to lack of durability of a majority of the modified components.

AD Development and Proof Service, Aberdeen Proving Ground, Md. 21005 Accession No. Final Report of USATECOM Project No. 1-6-4030-12, Product Improvement Test of Truck Utility, 1/4-Ton, 4X4, ML51, Modified with Solid Rear Axle, March 1967
ROUTE Project No. Not Available, Report No. DPS-2309
Author C. M. Bryzek, Jr.
Secondary distribution controlled by the Project Manager
54 pages, 18 illustrations

Unclassified Report

A product improvement test was conducted on a truck, utility, 1/4-ton, 4x4, M151, modified with solid rear axle, at Aberdeen Proving Ground (APG) from 12 April to 30 December 1966. The purpose of this test was to determine the engineering performance and durability characteristics of the vehicle. The vehicle was subjected to limited engineering performance tests and 20,000-mile durability test. It was concluded that the M151 modified with solid rear axle was unsatisfactory due to lack of durability of a majority of the modified components.

AD Accession No.
Development and Proof Service, Aberdeen Proving Ground, Md. 21005
Final Report of USATECOM Project No. 1-6-4030-12, Product Improvement Test of Truck,
Utility, 1/4-Ton, 4X4, M151, Modified with Solid Rear Axle, March 1967
RDT&E Project No. Not Available, Report No. DPS-2309
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Development and Proof Service, Aberdeen Proving Ground, Md. 21005
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Unclassified

Security Classification

DOCUMENT CONTROL DATA - R&D

(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)

1. ORIGINATING ACTIVITY (Corporate author)		2a. REPORT SECURITY CLASSIFICATION Unclassified
Development and Proof Services Aberdeen Proving Ground, Maryland 21005		2b. GROUP
3. REPORT TITLE PRODUCT IMPROVEMENT TEST OF TRUCK, UTILITY, 1/4-TON, 4X4, M151, MODIFIED WITH SOLID REAR AXLE		
4. DESCRIPTIVE NOTES (Type of report and inclusive dates) Final Report 12 April through 30 December 1966		
5. AUTHOR(S) (Last name, first name, initial) Bryzek, C. M., Jr.		
6. REPORT DATE MARCH 1967	7a. TOTAL NO. OF PAGES 54	7b. NO. OF REFS 0
8a. CONTRACT OR GRANT NO. Not applicable	9a. ORIGINATOR'S REPORT NUMBER(S) DPS-2309	
b. PROJECT NO. USATECOM Project No. 1-6-4030-12	9b. OTHER REPORT NO(S) (Any other numbers that may be assigned this report)	
c. d.		
10. AVAILABILITY/LIMITATION NOTICES This document may be further distributed by any holder only with specific prior approval of the Project Manager, ATTN: AMCPM-GP-TLV.		
11. SUPPLEMENTARY NOTES None	12. SPONSORING MILITARY ACTIVITY USATACOM	
13. ABSTRACT A product improvement test was conducted on a truck, utility, 1/4-ton, 4x4, M151, modified with solid rear axle, at Aberdeen Proving Ground (APG) from 12 April to 30 December 1966. The purpose of this test was to determine the engineering performance and durability characteristics of the vehicle. The vehicle was subjected to limited engineering performance tests and a 20,000-mile durability test. It was concluded that the M151 modified with solid rear axle was unsatisfactory due to lack of durability of a majority of the modified components.		

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Unclassified

Security Classification

Security Classification

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	ROLE	WT	ROLE	WT	ROLE	WT
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4. DESCRIPTIVE NOTES: If appropriate, enter the type of report, e.g., interim, progress, summary, annual, or final. Give the inclusive dates when a specific reporting period is covered.						
5. AUTHOR(S): Enter the name(s) of author(s) as shown on or in the report. Enter last name, first name, middle initial. If military, show rank and branch of service. The name of the principal author is an absolute minimum requirement.						
6. REPORT DATE: Enter the date of the report as day, month, year; or month, year. If more than one date appears on the report, use date of publication.						
7a. TOTAL NUMBER OF PAGES: The total page count should follow normal pagination procedures, i.e., enter the number of pages containing information.						
7b. NUMBER OF REFERENCES: Enter the total number of references cited in the report.						
8a. CONTRACT OR GRANT NUMBER: If appropriate, enter the applicable number of the contract or grant under which the report was written.						
8b, 8c, & 8d. PROJECT NUMBER: Enter the appropriate military department identification, such as project number, subproject number, system numbers, task number, etc.						
9a. ORIGINATOR'S REPORT NUMBER(S): Enter the official report number by which the document will be identified and controlled by the originating activity. This number must be unique to this report.						
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If the report has been furnished to the Office of Technical Services, Department of Commerce, for sale to the public, indicate this fact and enter the price, if known.						
11. SUPPLEMENTARY NOTES: Use for additional explanatory notes.						
12. SPONSORING MILITARY ACTIVITY: Enter the name of the departmental project office or laboratory sponsoring (paying for) the research and development. Include address.						
13. ABSTRACT: Enter an abstract giving a brief and factual summary of the document indicative of the report, even though it may also appear elsewhere in the body of the technical report. If additional space is required, a continuation sheet shall be attached.						
<p>It is highly desirable that the abstract of classified reports be unclassified. Each paragraph of the abstract shall end with an indication of the military security classification of the information in the paragraph, represented as (TS), (S), (C), or (U).</p> <p>There is no limitation on the length of the abstract. However, the suggested length is from 150 to 225 words.</p>						
14. KEY WORDS: Key words are technically meaningful terms or short phrases that characterize a report and may be used as index entries for cataloging the report. Key words must be selected so that no security classification is required. Identifiers, such as equipment model designation, trade name, military project code name, geographic location, may be used as key words but will be followed by an indication of technical context. The assignment of links, rules, and weights is optional.						

Security Classification



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
PROGRAM EXECUTIVE OFFICE
COMBAT SUPPORT & COMBAT SERVICE SUPPORT
6501 EAST 11 MILE ROAD
WARREN, MICHIGAN 48397-5000

SFAE-CSS

22 MAR 2013

MEMORANDUM FOR Defense Technical Information Center (DTIC-OQ), 8725 John J. Kingman Road, Fort Belvoir, VA 22060-6218

SUBJECT: Change of Classification Level to 4M151 Truck Documents

1. Reference Defense Technical Information Center (DTIC) Infosec "RE: M151A2 Documents retrieval and review" direction email of 14 December 2012.
2. In accordance with the above reference, please change the classification and distribution level for the following documents:
 - a. Document.
 - (1) The DTIC AD#: ADB271644
 - (2) Title: M151 Transmission Clutch Hub Insert – P/N 7059129
 - (3) Date of Document: 29 February 1972
 - (4) New Distribution/Classification: Distribution A. Approved for public release; distribution is unlimited.
 - (5) Reason for Change: This document has been reviewed for Operations Security (OPSEC) and has been deemed to contain no OPSEC concerns. The documents are for the M151 Truck that has not been in the military inventory since the early 1980s; the vehicle and associated documents are obsolete.
 - (6) Date of Change: Immediately
 - b. Document 2.
 - (1) The DTIC AD#: AD0474825
 - (2) Title: ENGINEER DESIGN TEST OF TRUCK, UTILITY, 1/4-TON, 4X4, M151 (RIDE AND HANDLING CHARACTERISTICS)
 - (3) Date of Document: 15 December 1965

SFAE-CSS

SUBJECT: Change of Classification Level to 4M151 Truck Documents

(4) New Distribution/Classification: Distribution A. Approved for public release; distribution is unlimited.

(5) Reason for Change: This document has been reviewed for OPSEC and has been deemed to contain no OPSEC concerns. The documents are for the M151 Truck that has not been in the military inventory since the early 1980s; the vehicle and associated documents are obsolete.

(6) Date of Change: Immediately

c. Document 3.

(1) The DTIC AD#: AD0857240

(2) Title: Product Improvement Test of Truck, Utility, 1/4-TON, 4X4, M151 Series with Modified Independent Rear Suspension System

(3) Date of Document: 27 June 1969

(4) New Distribution/Classification: Distribution A. Approved for public release; distribution is unlimited.

(5) Reason for Change: This document has been reviewed for OPSEC and has been deemed to contain no OPSEC concerns. The documents are for the M151 Truck that has not been in the military inventory since the early 1980s; the vehicle and associated documents are obsolete.

(6) Date of Change: Immediately

d. Document 4.

(1) The DTIC AD#: ADB273320

(2) Title: Bonded vs. Riveted Brake Lining Test

(3) Date of Document: 12 January 1977

(4) New Distribution/Classification: Distribution A. Approved for public release; distribution is unlimited.

SFAE-CSS

SUBJECT: Change of Classification Level to 4M151 Truck Documents

(5) Reason for Change: This document has been reviewed for OPSEC and has been deemed to contain no OPSEC concerns. The documents are for the M151 Truck that has not been in the military inventory since the early 1980s; the vehicle and associated documents are obsolete.

(6) Date of Change: Immediately

e. Document 5.

(1) The DTIC AD#: AD0810372

(2) Title: Product Improvement Test of Truck, Utility, 1/4-TON, 4X4, M151 Modified with Solid Rear Axle

(3) Date of Document: March 1967

(4) New Distribution/Classification: Distribution A. Approved for public release; distribution is unlimited.

(5) Reason for Change: This document has been reviewed for OPSEC and has been deemed to contain no OPSEC concerns. The documents are for the M151 Truck that has not been in the military inventory since the early 1980s; the vehicle and associated documents are obsolete.

(6) Date of Change: Immediately

f. Document 6.

(1) The DTIC AD#: ADB271624

(2) Title: Transmission Cluster Gear (M151 Vehicle)

(3) Date of Document: 06 March 1972

(4) New Distribution/Classification: Distribution A. Approved for public release; distribution is unlimited.

(5) Reason for Change: This document has been reviewed for OPSEC and has been deemed to contain no OPSEC concerns. The documents are for the M151 Truck that has not been in the military inventory since the early 1980s; the vehicle and associated documents are obsolete.

SFAE-CSS

SUBJECT: Change of Classification Level to 4M151 Truck Documents

(6) Date of Change: Immediately

3. The Point of Contact for this action is Robert Anick, Sr, email:
robert.d.anick.civ@mail.mil or COM (586) 282-8448.

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